REMARKS

A. Status

Claims 1-4, 8, 14, 67, 71-75, 77-79, and 81-84 remain pending. Claims 1, 2, 4, 14, 71-75, 77, 79, 82 and 84 have been amended. Claims 5-7, 9-11, 13, 30, 49-66, 68-70, 76, 80, and 85 have been cancelled. Thus, there are a total of 19 pending claims, of which claims 1 and 71 are independent.

B. Rejection of the Claims

In the Office action dated June 10, 2010, all of the then-pending claims were rejected under 35 U.S.C. 103(a). Claims 1-10, 51-60, 68, 70-79, 82, and 85 were rejected over U.S. Patent 6,208,616 to **Mahalingam et al.** (hereinafter "Mahalingam") in view of U.S. Patent 7,136,800 issued to **Vega** (hereinafter "Vega") and U.S. Patent 6,567,377 issued to **Vepa et al.** (hereinafter "Vepa"). Claims 11,, 13, 14, 61-63, 67, 69, 80, 81, 83 and 84 were rejected further in view of one or both of U.S. Patent 6,810,421 to Ishizaki et al. (hereinafter "Ishizaki") and U.S. Patent 7,203,944 to Rietschote et al. (hereinafter "Rietschote").

Additionally, claims 30, 49, 50, and 64-66 were rejected under Section 103(a), but with U.S. Patent 7,111,303 to **Macchiano** as the primary reference. The secondary references are combinations of Vega, Mahalingam, and Rietschote.

As described fully below, Applicants have amended the claims to more clearly distinguish the claimed invention from the prior art. While each claim that was rejected over the Macchiano patent has been canceled, the below marks will nevertheless refer to Macchiano.

C. Amendments to the Claims

Applicants note with appreciation that the Office action directly addressed the remarks presented by Applicants in an Amendment filed in February 2010.

Applicants have amended the claims to more particularly point out and distinctly describe the subject matter which patentably distinguishes the claimed invention from that which was obvious to a person of ordinary skill in the art as of the date of invention. The remaining independent claims (claims 1 and 71) both describe a "many-to-many approach" to transferring outgoing data frames. The amended claims now describe a plurality of VMs

executing as guests and describe a plurality of physical NICs from which one is selected for transferring the outgoing data frame provided by one of the VMs. Each VM includes at least one virtual NIC. Thus, there are multiple virtual NICs from which data frames may be provided and there are multiple physical NICs by which the outgoing data frame may be transferred.

The "many-to-many approach" (or "many to a selected one of many approach") of the claimed method is executed within a virtual computer system. The virtual computer system comprises a host platform and the plurality of VMs executing as guests of the host platform. The VMs execute as guests via virtualization software comprising one or layers interfacing between the VMs and the host platform. The method of amended claim 1 comprises obtaining access to the outgoing data frame via the virtual NIC of the particular VM that provided the data frame, receiving NIC management information and VM-specific information, and selecting a physical NIC for transfer of the outgoing data frame to a computer network.

Applicants respectfully point out that none of the cited references teaches the many-to-many approach executed within a system as set forth in the claims, *as amended*. Moreover the combination of the references does not teach or suggest the claimed method. With regard to the primary reference to Mahalingam, its teachings relate to communication within a network of computer systems. In Fig. 1 of Mahalingam, "outgoing data frames" to a "computer network" are data frames from one of three computer systems (10, 14 and 16) that are interconnected within the computer network by a network backbone (12). Two of the three computer systems (namely the client computers) utilize a conventional one-to-one approach, since each system is a single source of outgoing data frames and each system has a single NIC for its outgoing data frames. The third computer system of the Mahalingam network is the server computer (10) that utilizes a one-to-many approach. That is, while the server computer (10) is shown as including three NICs (18, 20, and 22), the server computer has a single provider of outgoing data frames to the three NICs.

Fig. 4 of Mahalingam shows alternative protocols (for example, TCP/IP) which may be applied to the outgoing data frames, but Applicants assert that the availability of alternative packet protocols in a protocol stack, as taught by Mahalingam, is fundamentally different than Applicants' claimed feature of obtaining access to outgoing data frames from one of a plurality of virtual NICs of the same computer system. That is, in the absence of

hindsight, provision of a protocol stack neither teaches nor suggests a plurality of VMs executing as guests on a host platform.

Fig. 4 of Mahalingam also shows the third computer system (i.e., the server computer) as including a virtual adapter (510). However, the single virtual adapter does not teach or suggest a method in which a NIC manager obtains access to an outgoing data frame from one of a plurality of virtual NICs which comprise one of a plurality of VMs executing as guests. At least as importantly, Mahalingam does not teach of suggest using VM-specific information as one basis for selecting a physical NIC for transferring an outgoing data frame.

Applicants recognize that when considering the claims as submitting in the Amendment of February 2010, the Office action did not rely upon Mahalingam for teaching "one or more VMs." It is also recognized that an Examiner should apply the "broadest reasonable interpretation" to the claims, so that the examination of the previously filed claims under Section 103(a) was based on the obviousness of modifying Mahalingam to include a VM as the single source of outgoing data frames (in place of a program as the single source of data frames). Therefore, Vega was cited for teaching a VM in the context of selecting among computer resources. It was noted in the Office action that "Vega is directed to allocating processor time…" (Page 7 of the Office action). Because independent claims 1 and 71 have been amended so as to now describe the method with respect to a plurality of VMs (with their plurality of virtual NICs) and a plurality of physical NICs, the obviousness determination changes. The teachings of Vega are consistent with those of Mahalingam, since neither of the cited references suggests a many-to-many approach in general and particularly does not suggest Applicants' claimed many-to-many approach of obtaining access from one of a plurality of VMs (and virtual NICs) for transfer by a selected one of a plurality of physical NICs. Therefore, in considering the amended claims, the citation of the two patents does not present a *prima facie* case of obviousness under Section 103(a).

The Vepa patent was cited as being relevant to the motivation of modifying Mahalingam in view of Vega. The teachings of Vepa are similar to those of Vega and Mahalingam, since the patent does not teach or suggest a many-to-many approach analogous to the claimed invention. Fig. 3 of Vepa illustrates the components of the prior art computer system (190) and Fig. 4 of the patent shows where the computer system (190) resides. The Office action points out that Vepa teaches that within the computer system, one possible factor in providing load balancing is the "source TCP port number" of the data packet. However, the amended claims are patentably distinguished from this teaching, even when

combined with the teachings of Vega and Mahalingam. As shown in Figs 3 and 4, all of the outgoing data packets/frames of Vepa originate from a single application layer (310) and network layer (320). Persons skilled in the art, in reading the Vepa patent, will readily recognize that the source TCP port number is an indication of the particular network application being executed in the application layer (310), such as an e-mail application having a source TCP port number "25" (see for example http://en.wikipedia.org/wiki/List_of_TCP_and_UDP_port_numbers). In comparison, amended claims 1 and 71 describe the plurality of sources of outgoing data frames as being identical "applications", namely VMs having NICs. Thus, the use of source TCP port numbers as taught by Vepa is distinguished from the amended claims both with respect to the available sources of machines which provide data frames (Vepa teaches packets reach the NICs from a single machine (190)) and with respect to the ability to distinguish sources (the source TCP port numbers are not intended to distinguish one computer (or VM) from another).

The Ishizaki reference was cited as being relevant to a limited number of dependent claims (claims relating to discarding data frames). The reference is not cited as teaching or suggesting the features of independent claims 1 or 71. Thus, even if the teachings of Mahalingam/Vega/Vepa were modified to incorporate selected features of Ishizaki, the resulting method would not render the amended claims obvious under Section 103(a).

Similarly, the Rietschote patent was cited only with regard to suspending VMs. The teachings of the patent do not cure the "deficiencies" of the combination of other teachings in establishing a *prima facie* case of obviousness with respect to the pending claims, as amended.

Finally, while the claims for which Macchiano was cited have all been canceled, Applicants respectfully note that the reference again teaches a method other than one that applies a many-to-many approach of the type set forth in the amended claims. Rather, Macchiano teaches an effective one-to-one approach. The patent is concerned with intra-system packet exchanges, not transfers to a network. Within a computer system, two VMs (also referred to as "user portions") execute different applications. Each VM includes a virtual NIC. When the first VM sends a datagram through its virtual NIC, the base portion that is shared by the two VMs enables access of the datagram by the virtual NIC of the second VM. As a consequence, the different applications running on the two VMs of the same computer system are able to share. Fig. 1 of Macchiano illustrates a "real computer"

having two VMs which are enabled to exchange datagrams. The first identified "object" of Macchiano is providing "a simplified method for IP communication between two user applications running in separate user portions/virtual machines with a common base portion of a virtual machine operating system" (column 3, lines 31-35). The one-to-one approach and the intra-system exchanges as taught by Macchiano do not teach or suggest the method described in the claims at issue.

Conclusion

Applicants respectfully request reconsideration of the outstanding rejections in light of the above arguments and a Notice of Allowance is respectfully and earnestly requested. The Examiner is invited to contact the undersigned at 650-427-4023 to discuss any additional changes the Examiner may feel is necessary in light of this Amendment.

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Respectfully submitted,

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